

What is claimed is:

1. A power supply method of supplying a high-potential drive power voltage to a driver circuit which receives a low-potential drive power voltage in addition to the high-potential drive power voltage and drives a plurality of data lines in a display panel which has a plurality of pixels and a plurality of scanning lines in addition to the data lines, the method comprising:

setting an output from the driver circuit to the data lines to a high-impedance state, and accumulating a charge corresponding to a charge discharged from the data lines in a parasitic capacitor of a power line of a regulator which outputs a drive power voltage to be supplied to the driver circuit, within a given period; and

outputting a voltage generated by the charge accumulated in the parasitic capacitor to the power line, and supplying a voltage generated by the regulator to the driver circuit as the high-potential drive power voltage for the driver circuit, after the period.

2. A power supply method of supplying a high-potential drive power voltage to a driver circuit which receives a low-potential drive power voltage in addition to the high-potential drive power voltage and drives a plurality of data lines in a display panel which has a plurality of pixels and a plurality of scanning lines in addition to the data lines, the method comprising:

setting an output from the driver circuit to the data lines to a high-impedance state, and accumulating a charge corresponding to a charge discharged from the data lines in a capacitor, one end of which is connected directly or through a specific component to a power line of a regulator which outputs a drive power voltage to be supplied to the driver circuit, within a given period; and

outputting a voltage generated by the charge accumulated in the capacitor to

the power line, and supplying a voltage generated by the regulator to the driver circuit as the high-potential drive power voltage for the driver circuit, after the period.

3. A power supply method of supplying a high-potential drive power voltage to a driver circuit which receives a low-potential drive power voltage in addition to the high-potential drive power voltage and drives a plurality of data lines in a display panel which has in addition to the data lines through each of which multiplexed data signals for first to third color components are transmitted:

a plurality of scanning lines;

a plurality of pixels, each of which is connected to one of the scanning lines and one of the data lines; and

a plurality of demultiplexers, each of which includes first to third demultiplexing switch elements respectively controlled by first to third demultiplex control signals, one end of each of the demultiplexing switch elements being connected to one of the data lines, and the other end of each of the demultiplexing switch elements being connected to a pixels for the j -th color component ($1 \leq j \leq 3$, j is an integer) among the pixels,

the method comprising:

setting an output from the driver circuit to the data lines to a high-impedance state, setting the first to third demultiplexing switch elements to an ON state by using the first to third demultiplex control signals, and accumulating a charge corresponding to a charge discharged from the data lines in a parasitic capacitor of a power line of a regulator which outputs a drive power voltage to be supplied to the driver circuit, within a given period; and

outputting a voltage generated by the charge accumulated in the parasitic capacitor to the power line, and supplying a voltage generated by the regulator to the driver circuit as the high-potential drive power voltage for the driver circuit, after the

period.

4. A power supply method of supplying a high-potential drive power voltage to a driver circuit which receives a low-potential drive power voltage in addition to the high-potential drive power voltage and drives a plurality of data lines in a display panel which has in addition to the data lines through each of which multiplexed data signals for first to third color components are transmitted:

a plurality of scanning lines;

a plurality of pixels, each of which is connected to one of the scanning lines

10 and one of the data lines; and

a plurality of demultiplexers, each of which includes first to third demultiplexing switch elements respectively controlled by first to third demultiplex control signals, one end of each of the demultiplexing switch elements being connected to one of the data lines, and the other end of each of the demultiplexing switch elements being connected to a pixels for the j -th color component ($1 \leq j \leq 3$, j is an integer) among the pixels,

the method comprising:

setting an output from the driver circuit to the data lines to a high-impedance state, setting the first to third demultiplexing switch elements to an ON state by using the first to third demultiplex control signals, and accumulating a charge corresponding to a charge discharged from the data lines in a capacitor, one end of which is connected directly or through a specific component to a power line of a regulator which outputs a drive power voltage to be supplied to the driver circuit, within a given period; and

outputting a voltage generated by the charge accumulated in the capacitor to the power line, and supplying a voltage generated by the regulator to the driver circuit as the high-potential drive power voltage for the driver circuit, after the period.

5. The power supply method as defined in claim 1,
wherein polarity of a voltage between a pixel electrode of each of the pixels connected to one of the data lines and a common electrode facing the pixel electrode through an electro-optical material is reversed during the period.

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6. The power supply method as defined in claim 2,
wherein polarity of a voltage between a pixel electrode of each of the pixels connected to one of the data lines and a common electrode facing the pixel electrode through an electro-optical material is reversed during the period.

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7. The power supply method as defined in claim 3,
wherein polarity of a voltage between a pixel electrode of each of the pixels connected to one of the data lines and a common electrode facing the pixel electrode through an electro-optical material is reversed during the period.

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8. The power supply method as defined in claim 4,
wherein polarity of a voltage between a pixel electrode of each of the pixels connected to one of the data lines and a common electrode facing the pixel electrode through an electro-optical material is reversed during the period.

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9. A power supply method of supplying a negative voltage to a driver circuit which receives high-potential-side and low-potential drive power voltages and drives a plurality of data lines in a display panel which has a plurality of pixels and a plurality of scanning lines in addition to the data lines, by utilizing a charge from a low-potential power line through which the low-potential drive power voltage is supplied, the method comprising:

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setting an output from the driver circuit to the data lines to a high-impedance

state, and accumulating a charge corresponding to a charge discharged from the data lines in a parasitic capacitor of the low-potential power line connected to a regulator which outputs the negative voltage, within a given period; and

outputting the negative voltage generated by the regulator based on a voltage generated by the charge accumulated in the parasitic capacitor, as the low-potential drive power voltage, after the period.

10. A power supply method of supplying a negative voltage to a driver circuit which receives high-potential-side and low-potential drive power voltages and drives a plurality of data lines in a display panel which has a plurality of pixels and a plurality of scanning lines in addition to the data lines, by utilizing a charge from a low-potential power line through which the low-potential drive power voltage is supplied; the method comprising:

setting an output from the driver circuit to the data lines to a high-impedance state, and accumulating a charge corresponding to a charge discharged from the data lines in a capacitor, one end of which is connected directly or through a specific component to the low-potential power line connected to a regulator which outputs the negative voltage, within a given period; and

outputting the negative voltage generated by the regulator based on a voltage generated by the charge accumulated in the capacitor, as the low-potential drive power voltage, after the period.

11. A power supply method of supplying a negative voltage by utilizing a charge from a low-potential power line through which a low-potential drive power voltage is supplied, to a driver circuit which receives a high-potential drive power voltage in addition to the low-potential drive power voltage and drives a plurality of data lines in a display panel which has in addition to the data lines through each of which multiplexed

data signals for first to third color components are transmitted:

a plurality of scanning lines;

a plurality of pixels, each of which is connected to one of the scanning lines and one of the data lines; and

5 a plurality of demultiplexers, each of which includes first to third demultiplexing switch elements respectively controlled by first to third demultiplex control signals, one end of each of the demultiplexing switch elements being connected to one of the data lines, and the other end of each of the demultiplexing switch elements being connected to a pixels for the j -th color component ($1 \leq j \leq 3$, j is an integer)
10 among the pixels,

the method comprising:

setting an output from the driver circuit to the data lines to a high-impedance state, setting the first to third demultiplexing switch elements to an ON state by using the first to third demultiplex control signals, and accumulating a charge corresponding
15 to a charge discharged from the data lines in a parasitic capacitor of the low-potential power line connected to a regulator which outputs the negative voltage, within a given period; and

outputting the negative voltage generated by the regulator based on a voltage generated by the charge accumulated in the parasitic capacitor, as the low-potential
20 drive power voltage, after the period.

12. A power supply method of supplying a negative voltage by utilizing a charge from a low-potential power line through which a low-potential drive power voltage is supplied, to a driver circuit which receives a high-potential drive power voltage in
25 addition to the low-potential drive power voltage and drives a plurality of data lines in a display panel which has in addition to the data lines through each of which multiplexed data signals for first to third color components are transmitted:

a plurality of scanning lines;

a plurality of pixels, each of which is connected to one of the scanning lines and one of the data lines; and

5 a plurality of demultiplexers, each of which includes first to third demultiplexing switch elements respectively controlled by first to third demultiplex control signals, one end of each of the demultiplexing switch elements being connected to one of the data lines, and the other end of each of the demultiplexing switch elements being connected to a pixels for the j -th color component ($1 \leq j \leq 3$, j is an integer) among the pixels,

10 the method comprising:

setting an output from the driver circuit to the data lines to a high-impedance state, setting the first to third demultiplexing switch elements to an ON state by using the first to third demultiplex control signals, and accumulating a charge corresponding to a charge discharged from the data lines in a capacitor, one end of which is connected
15 directly or through a specific component to the low-potential power line connected to a regulator which outputs the negative voltage, within a given period; and

outputting the negative voltage generated by the regulator based on a voltage generated by the charge accumulated in the capacitor, as the low-potential drive power voltage, after the period.

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13. The power supply method as defined in claim 9,
wherein no input signal is accepted by the driver circuit during the period.

14. The power supply method as defined in claim 10,
25 wherein no input signal is accepted by the driver circuit during the period.

15. The power supply method as defined in claim 11,

wherein no input signal is accepted by the driver circuit during the period.

16. The power supply method as defined in claim 12,
wherein no input signal is accepted by the driver circuit during the period.

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17. The power supply method as defined in claim 13,
wherein an output of an input buffer to which the input signal is input is fixed
to the low-potential drive power voltage of the driver circuit.

10 18. The power supply method as defined in claim 9,
wherein outputting a control signal to the driver circuit from a controller which
controls the driver circuit is suspended during the period.

19. The power supply method as defined in claim 18,
15 wherein an output of the control signal is fixed to a low-potential-side power
voltage of the controller.

20. The power supply method as defined in claim 9,
wherein polarity of a voltage between a pixel electrode of each of the pixels
20 connected to one of the data lines and a common electrode facing the pixel electrode
through an electro-optical material is reversed during the period.

21. The power supply method as defined in claim 10,
wherein polarity of a voltage between a pixel electrode of each of the pixels
25 connected to one of the data lines and a common electrode facing the pixel electrode
through an electro-optical material is reversed during the period.

22. The power supply method as defined in claim 11,
wherein polarity of a voltage between a pixel electrode of each of the pixels connected to one of the data lines and a common electrode facing the pixel electrode through an electro-optical material is reversed during the period.

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23. The power supply method as defined in claim 12,
wherein polarity of a voltage between a pixel electrode of each of the pixels connected to one of the data lines and a common electrode facing the pixel electrode through an electro-optical material is reversed during the period.

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24. A power supply circuit which supplies a high-potential drive power voltage to a driver circuit which receives a low-potential drive power voltage in addition to the high-potential drive power voltage and drives a plurality of data lines in a display panel which has a plurality of pixels and a plurality of scanning lines in addition to the data
15 lines, the power supply circuit comprising:

a regulator which operates using a first voltage supplied to a power line of the regulator as a power voltage, and outputs a voltage obtained by regulating an input voltage which is the first voltage or a voltage obtained by dividing the first voltage;

a first switching circuit, one end of the first switching circuit being connected
20 with an output node to which the high-potential drive power voltage of the driver circuit is output and the other end of the first switching circuit being connected with output of the regulator; and

a second switching circuit, one end of the second switching circuit being connected with the output node and the other end of the second switching circuit being
25 connected with the power line, wherein:

the first switching circuit is turned off, the second switching circuit is turned on, and a charge corresponding to a charge discharged from the data lines is accumulated in

a parasitic capacitor of the power line of the regulator during a given period in which an output from the driver circuit to the data lines is set to a high impedance state, and polarity of a voltage between a pixel electrode of each of the pixels connected to one of the data lines and a common electrode facing the pixel electrode through an electro-optical material is reversed; and

the first switching circuit is turned on, the second switching circuit is turned off, and the regulated voltage is output to the output node by the regulator to which a voltage generated by the charge accumulated in the parasitic capacitor is supplied as a power voltage of the regulator.

25. A power supply circuit which supplies a high-potential drive power voltage to a driver circuit which receives a low-potential drive power voltage in addition to the high-potential drive power voltage and drives a plurality of data lines in a display panel which has a plurality of pixels and a plurality of scanning lines in addition to the data lines, the power supply circuit comprising:

a regulator outputs a voltage obtained by regulating an input voltage which is a first voltage or a voltage obtained by dividing the first voltage;

a first switching circuit, one end of the first switching circuit being connected with an output node to which the high-potential drive power voltage of the driver circuit is output and the other end of the first switching circuit being connected with output of the regulator; and

a second switching circuit, one end of which is connected to the output node;

a capacitor, one end of the capacitor being connected to the other end of the second switching circuit, and the other end of the capacitor being connected to a system power line; and

a diode connected between the other end of the second switching circuit and a power line of the regulator to which is supplied a power voltage so that a direction from

the system power line to the power line of the regulator is a forward direction, wherein:

the first switching circuit is turned off, the second switching circuit is turned on, and a charge corresponding to a charge discharged from the data lines is accumulated in the capacitor during a given period in which an output from the driver circuit to the data
5 lines is set to a high impedance state, and polarity of a voltage between a pixel electrode of each of the pixels connected to one of the data lines and a common electrode facing the pixel electrode through an electro-optical material is reversed; and

the first switching circuit is turned on, the second switching circuit is turned off, and the regulated voltage is output by the regulator to which a voltage generated by the
10 charge accumulated in the parasitic capacitor is supplied as a power voltage of the regulator.

26. A power supply circuit which outputs a negative voltage to a driver circuit which receives high-potential and low-potential drive power voltages and drives a
15 plurality of data lines in a display panel which has a plurality of pixels and a plurality of scanning lines in addition to the data lines, by utilizing a charge from a low-potential power line through which the low-potential drive power voltage is supplied,

the power supply circuit comprising:

a regulator which outputs a voltage obtained by regulating a negative voltage
20 input to the regulator;

a fourth switching circuit, one end of the fourth switching circuit being connected to an output node which outputs the low-potential drive power voltage for the driver circuit, and the other end of the fourth switching circuit being connected to a system ground power line to which a ground power voltage of the power supply circuit
25 is supplied; and

a fifth switching circuit, one end of the fifth switching circuit being connected to the output node, and the other end of the fifth switching circuit being connected to a

low-potential power line of the regulator directly or through a specific device, wherein:

the fourth switching circuit is turned off, the fifth switching circuit is turned on, and a charge corresponding to a charge discharged from the data lines is accumulated in a parasitic capacitor of the low-potential power line of the regulator during a given
5 period in which an output from the driver circuit to the data lines is set to a high impedance state, and polarity of a voltage between a pixel electrode of each of the pixels connected to one of the data lines and a common electrode facing the pixel electrode through an electro-optical material is reversed; and

the fourth switching circuit is turned on, the fifth switching circuit is turned off,
10 and a voltage generated by the charge accumulated in the parasitic capacitor is output to the low-potential power line of the regulator.

27. A power supply circuit which outputs a negative voltage to a driver circuit which receives high-potential-side and low-potential drive power voltages and drives a
15 plurality of data lines in a display panel which has a plurality of pixels and a plurality of scanning lines in addition to the data lines, by utilizing a charge from a low-potential power line through which the low-potential drive power voltage is supplied,

the power supply circuit comprising:

a regulator which outputs a voltage obtained by regulating a negative voltage
20 input to the regulator;

a fourth switching circuit, one end of the fourth switching circuit being connected to an output node which outputs the low-potential drive power voltage for the driver circuit, and the other end of the fourth switching circuit being connected to a system ground power line to which a ground power voltage of the power supply circuit
25 is supplied;

a fifth switching circuit, one end of which is connected to the output node;

a capacitor, one end of the capacitor being connected to the other end of the

fifth switching circuit, and the other end of the capacitor being grounded; and

a diode connected between a low-potential power line of the regulator and the other end of the fifth switching circuit so that a direction from the low-potential power line of the regulator to the fifth switching circuit is a forward direction, wherein:

5 the fourth switching circuit is turned off, the fifth switching circuit is turned on, and a charge corresponding to a charge discharged from the data lines is accumulated in the capacitor during a given period in which an output from the driver circuit to the data lines is set to a high impedance state, and polarity of a voltage between a pixel electrode of each of the pixels connected to one of the data lines and a common electrode facing
10 the pixel electrode through an electro-optical material is reversed; and

 the fourth switching circuit is turned on, the fifth switching circuit is turned off, and a voltage generated by the charge accumulated in the capacitor is output to the low-potential power line of the regulator.